

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

MORI, Michio  
M. MORI PATENT OFFICE, Amagasaki Building,  
Higashinaniwa-cho 5-chome, Amagasaki-shi, Hyogo  
6600892  
JAPON



Date of mailing (*day/month/year*)  
06 July 2006 (06.07.2006)

Applicant's or agent's file reference  
FD049-PCT

**IMPORTANT NOTIFICATION**

International application No.  
PCT/JP2004/014725

International filing date (*day/month/year*)  
06 October 2004 (06.10.2004)

Applicant

SUMITOMO TITANIUM CORPORATION et al

**1. Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

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1211 Geneva 20, Switzerland

Authorized officer

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# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

**TRANSLATION**  
**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

<div style="border: 1px solid black; width: 100%; height: 100%;"></div>		Date of mailing (day/month/year)
Applicant's or agent's file reference <b>FD049-PCT</b>		<b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No. <b>PCT/JP2004/014725</b>	International filing date (day/month/year) <b>06.10.2004</b>	Priority date (day/month/year) <b>10.10.2003</b>
International Patent Classification (IPC) or both national classification and IPC		
Applicant <b>SUMITOMO TITANIUM CORPORATION</b>		

1. This opinion contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/014725

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference FD049-PCT	FOR FURTHER ACTION See item 4 below	
International application No. PCT/JP2004/014725	International filing date ( <i>day/month/year</i> ) 06 October 2004 (06.10.2004)	Priority date ( <i>day/month/year</i> ) 10 October 2003 (10.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant SUMITOMO TITANIUM CORPORATION		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	Date of issuance of this report 26 June 2006 (26.06.2006)
	Authorized officer  Yoshiko Kuwahara  e-mail: pt07@wipo.int

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/014725

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-23

YES

Claims

NO

Inventive step (IS)

Claims 13, 14

YES

Claims 1-12, 15-23

NO

Industrial applicability (IA)

Claims 1-23

YES

Claims

NO

2. Citations and explanations:

Document 1: JP 2001-192748 A (NKK Corp.), 17 July 2001 (17.07.01)

Document 2: JP 64-047823 A (Toho Titanium Co., Ltd.), 22 February, 1989 (22.02.89)

Document 3: US 4487677 A (Metals Production Research, Inc.) 11 December, 1984 (11.12.84) & JP 60-238429 A

Document 1 describes the following with regard to a method for producing Ti alloy through the reduction of  $TiCl_4$  with metal reducer: a method for producing Ti alloy having a reaction of reduction with the presence of molten salt halide; the metal reducer is Mg or Na; the molten salt halide is  $MgCl_2$ , NaCl or, KCl or its mixture, other halogenated compound or its mixture; molten salt as by-product (such as  $MgCl_2$ ) is separated into metal (such as Mg) and chlorine gas through electrolyzation device while keeping its temperature at 750 to 800°C; the metal is recycled as metal reducer; chlorine gas is reused as material when producing  $TiCl_4$  from  $TiO_2$ ; titanium metal powder with 10 to 40µm of grain diameter can be obtained through the method; and continuous production of titanium metal is possible through the method. (See especially the subject matter of claim par. nos.: [0043]-[0049] and [0055]-[0057] and relevant figures.)

Document 2 describes the following with regard to a method for producing Ti alloy through the reduction of  $TiCl_4$  with metal reducer: the temperature of reaction vessel should be kept higher than the melting point of metal reducer and metal reducer chloride (such as  $MgCl_2$ ); Mg, Na, Ca and K can be used as metal reducer; and metal reducer chloride, by-product including  $MgCl_2$  should be discharged out of the reaction vessel. (See especially the subject claim of claim, page 3, upper right column, page 4, lower left column and relevant figures.)

Document 3 describes a method for producing Ti alloy through the following procedure: obtain  $MgCl_2$  and Ti alloy through the reaction between  $TiCl_4$  and metal Mg; remove  $MgCl_2$  and remaining Mg; obtain metal Mg through electrolyzation; and chlorine gas which is to be re-used for reduction reaction with  $TiCl_4$  and concurrently generated is used to produce  $TiCl_4$  through reaction with  $TiO_2$ . (See especially the subject matter of claim.)

Utilizing Ca as metal reducer could be easily conceived by a person skilled in the art with regard to the document 1 since the inventions described in the documents 1-3 include a method for producing Ti alloy through reaction between  $TiCl_4$  and alkali metal or metal reducer chosen from alkaline earth metal. Also, since the melting point of metal calcium and NaCl is 838 °C and 772 °C respectively, a person skilled in the art should easily set the temperature of the molten salt higher than the temperature of the said two chemicals and within 500 to 1000 °C.

Moreover effect that is expected to be generated by the present invention should be easily predicted by a person skilled in the art thanks to the descriptions of the documents 1-3 above.